Remarks

Claims 1-26, 32, 38-63, and 69 have been canceled without prejudice or disclaimer. Applicants reserve the right to pursue the canceled subject matter in one or more continuing applications. Claims 27, 29, 64, and 66 have been amended. Claims 77-126 have been added. No new matter has been added.

Claims 27-31, 33-37, 64-68, 70-126 are pending.

I. Information Disclosure Statement

The Examiner has acknowledged receipt of the information disclosure statement (IDS) submitted 9/17/03. However, references AK and AL have not been considered since no publication date was indicated as required by M.P.E.P. § 609.

Applicants thank the Examiner for pointing out this inadvertent error. To comply with M.P.E.P. § 609, Applicants submit herewith another Form 1449 listing references AK and AL with their respective publication dates. Applicants respectfully request that the Examiner consider these references by initialing the Form 1449 submitted herewith.

II. Objection to the Specification

Applicants acknowledge the Examiner's objection to the specification. In paragraph 18 of the specification, it is explicitly stated that an in-frame termination codon is depicted at position 213 in Figure 2. Hence, SEQ ID NO:2 as shown in Figure 2 is 212 amino acids in length; 5 additional "hypothetical" amino acids are depicted after the stop codon. As discussed with the Examiner, Applicants submit herewith an amended Figure 2 that eliminates amino acid positions 213-218 from the figure. The bottom line in the alignment of the new figure is now identical to SEQ ID NO:2. Applicants respectfully request that new Figure 2 be made part of the record. No new matter has been introduced. Applicants note that the nucleotides encoding the previously depicted "hypothetical" residues are still shown in Fig. 1 and in SEQ ID NO:1.

III. Rejection of Claims Under 35 U.S.C. § 112, Second Paragraph

Claims 27, 29-31, 33-36, 64, 66-68, 70-73 have been rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite due to the recitation of the phrase "complementary strand." *See* Paper No. 20031112, page 4.

Applicants respectfully disagree and traverse. Applicants assert that one of ordinary skill in the art would clearly understand what the Applicants regard as their invention by the claims as currently presented. Nevertheless, Applicants have amended the claims 27, 29, 64, and 66 as suggested by the Examiner. *See* Paper No. 20031112, page 4, item 6. In view of the above, Applicants submit that the rejection under 35 U.S.C. § 112, second paragraph, has been obviated. Accordingly, Applicants respectfully request that the rejection of the claims under 35 U.S.C. § 112, second paragraph, be reconsidered and withdrawn.

IV. Rejection of Claims Under 35 U.S.C. § 112, First Paragraph

A. Written Description of Claims 1-6, 9-10, 12-20, 22-31, 33-43, 46-47, 49-57, 59-68 and 70-74

Claims 1-6, 9-10, 12-20, 22-31, 33-43, 46-47, 49-57, 59-68 and 70-74 have been rejected under 35 U.S.C. § 112, first paragraph. The Examiner alleges that the claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. More particularly, the Examiner asserts:

> The specification discloses the structure and function of SEQ ID NO:2 as well as that of the corresponding polynucleotide, i.e., SEQ ID NO:1. However, the specification does not contain any disclosure of the structure or function of all the nucleic acids included in the claimed genera.
>
> In addition, while sufficient written description of a genus of DNAs may be achieved by a recitation of a representative number of DNAs defined by nucleotide sequence or a recitation of structural features common to members of the genus, which feature constitute a substantial portion of the genus, in the instant case, the recited structural features, such as "30 contiguous amino acids of the polypeptide of SEQ ID NO:2", "50 contiguous amino acids of the polypeptide of SEQ ID NO:2", "50 contiguous nucleotides of nucleotide 626-1260 of SEQ ID NO:1", do not constitute a substantial portion of the genus as the remainder of any nucleic acid comprising said structural elements is completely undefined and the specification does not define the remaining structural features for members of the genus to be selected. Many functionally and structurally unrelated polynucleotides are encompassed by these claims.

See Paper No. 20031112, page 5, line 14 to page 6, line 14.

Applicants respectfully disagree and traverse.

Preliminarily, Applicants have canceled claims 1-6, 9-10, 12-20, 22-26, 38-43, 46-47, 49-57, and 59-63, thus rendering the rejection to these claims moot. Applicants have further submitted new claims 77-152. This rejection will be addressed as it may be applied to pending claims 27-31, 33-37, 64-68, 70-74 and 77-126.

Applicants note that claims 27-31, 33-37, 64-68, 70-74 claim at least 50 contiguous nucleotide fragments; claims 77-90 claim nucleotide sequences encoding the full-length polypeptide, full-length polypeptide minus the N-terminal methionine, and the amino acid sequence of the purine binding motif of HPRT-2; claims 91-102 claim nucleotide sequences encoding fragments of at least 30 or 50 contiguous amino acids of the full-length polypeptide; claims 103-114 claim nucleotide sequences encoding variants of the polypeptide having a specified activity; and claims 115-126 claim nucleotide sequences encoding fragments of the polypeptide having a specified activity.

The test for the written description requirement is whether one skilled in the art could reasonably conclude that the inventor had possession of the claimed invention in the specification as filed. *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563, 19 U.S.P.Q.2d 1111, 1116 (Fed. Cir. 1991); M.P.E.P. § 2163.02. The Federal Circuit recently re-emphasized the well-settled principle of law that "[t]he written description requirement does not require the applicant 'to describe exactly the subject matter claimed, [instead] the description must clearly allow persons of ordinary skill in the art to recognize that [they] invented what is claimed,'" *Union Oil Co. v. Atlantic Richfield Co.*, 208 F.3d 989, 54 U.S.P.Q.2d 1227 (Fed. Cir. 2000), hereinafter referred to as "*Unocal.*" While the applicant must "blaze marks on trees," rather than "simply [provide] the public with a forest of trees," an Applicant is not required to explicitly describe each of the trees in the forest. *See Unocal*, 208 F.3d at 1000. The Court emphasized the importance of what the person of ordinary skill in the art would understand from reading the specification, rather than whether the specific embodiments had been explicitly described or exemplified. Indeed, as the court noted, "the issue is whether one of skill in the art could derive the claimed ranges from the patent's disclosure." *Unocal*, 208 F.3d at 1001 (emphasis added).

Claims 27-31, 33-37, 64-68, 70-74 claim an isolated nucleic acid molecule comprising at least 50 contiguous nucleotides of SEQ ID NO:1 or the cDNA contained in ATCC Deposit No. 75844, or the completely complementary strand thereof. The

structural feature common to all members of the claimed genus is the sequence provided in SEQ ID NO:1 and the cDNA contained in ATCC Deposit No. 75844. Applicants assert that the skilled artisan would be able to readily envision and identify sequences of at least 50 contiguous nucleic acids of SEQ ID NO:1 and the cDNA contained in ATCC Deposit No. 75844. Thus, one of skill in the art can easily identify each and every claimed fragment.

Claims 103-126 claim a product by function, *i.e.*, a polynucleotide encoding a polypeptide that is at least 90% (or 95%) identical to the reference polypeptide and a polynucleotide encoding a polypeptide fragment, said polypeptide or polypeptide fragment having HPRT-2 activity. Nothing more than a basic knowledge of the genetic code and what is described in the specification would be required for the skilled artisan to identify every single one of the polynucleotides which encode polypeptides that are 90% or 95% identical to the amino acid sequence of SEQ ID NO:2 or to the polypeptide encoded by the cDNA contained in ATCC Deposit No. 75844. Again, the structural feature common to all members of this genus is the sequence provided in SEQ ID NO:1 and the cDNA contained in ATCC Deposit No. 75844. Accordingly, Applicants respectfully submit that one of ordinary skill in the art could readily envision each and every member of the claimed genus and thus would recognize that Applicants were in possession of the invention as claimed at the time of filing. Applicants assert the disclosure meets the requirements of 35 U.S.C. § 112, first paragraph, as providing adequate written description for the claimed invention.

The Examiner has cited several references in support of the argument that a structural homology does not necessarily translate into functional homology. Applicants assert that an evaluation of function is not germane to the question of whether the written description requirement has been satisfied. The written description requirement is separate and distinct from the enablement requirement. *See Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1560, 19 U.S.P.Q.2d 1111, 1114 (Fed. Cir. 1991). Applicants respectfully submit that the application provides sufficient written description to allow a skilled artisan to determine that Applicants were in possession of the claimed invention. Accordingly, Applicants submit that the pending claims fully meet the written description requirements of 35 U.S.C. § 112, first paragraph, and respectfully request that the Examiner's rejection of the claims under 35 U.S.C. § 112, first paragraph, be reconsidered and withdrawn.

B. Enablement of Claims 38-47, 49-57, 59-68, and 70-74

The Examiner has rejected claims referencing an ATCC Deposit No. under 35 U.S.C. § 112, first paragraph, and has requested an affidavit or declaration regarding the deposit made under the Budapest Treaty to remedy the alleged deficiency. *See* Paper No. 20031112, page 7, lines 12-17.

Preliminarily, Applicants point out that claims 38-47, 49-57, 59-63 have been canceled, thus rendering the rejection to these claims moot. Applicants respectfully request that the rejection to these claims be reconsidered and withdrawn.

With respect to the pending claims, Applicants submit herewith a Statement Concerning the Deposited cDNA Clone in accordance with the Examiner's request. By submission of this declaration, Applicants submit that the rejections under 35 U.S.C. § 112, first paragraph, have been obviated. Accordingly, Applicants respectfully request that this rejection be reconsidered and withdrawn.

C. Enablement of Claims 1-6, 9-10, 12-20, 22-31, 33-43, 46-47, 49-57, 59-68 and 70-74

Claims 1-6, 9-10, 12-20, 22-31, 33-43, 46-47, 49-57, 59-68 and 70-74 have been rejected under 35 U.S.C. § 112, first paragraph, as not enabled by the specification. Specifically, the Examiner alleges:

> The specification does not reasonably provide enablement for a polynucleotide of any function (1) comprising a nucleotide sequence encoding a polypeptide having at least 90% or 95% sequence identity to the polypeptide of SEQ ID NO:2 ... or any fragment of the polypeptide of SEQ ID NO:2 ... with HPRT activity, (2) comprising a nucleotide sequence encoding at least 30 or 50 contiguous amino acids of the polypeptide of SEQ ID NO:2 ..., (3) comprising at least 50 continuous nucleotides of nucleotides 626-1260 of SEQ ID NO:1 ..., (4) vectors comprising (1)-(3), (5) host cells comprising (4), or (6) methods of producing the polypeptides encoded by (1)-(3).

See Paper No. 20031112, page 8, section 10.

Applicants disagree and traverse.

Preliminarily, Applicants have canceled claims 1-6, 9-10, 12-20, 22-26, 38-43, 46-47, 49-57, 59-63, thus rending the rejection to these claims moot. Furthermore, Applicants have submitted new claims 77-126. Applicants submit that the currently pending claims are enabled.

Applicants respectfully submit that the Federal Circuit has held that making the claimed species and screening them for a function is acceptable, as long as the experimentation is not undue. As in all cases, the test is whether it would require undue experimentation to practice the invention – even when a claim might encompass some inoperative embodiments. *See generally, Atlas Powder v. E.I. Du Pont de Nemours & Co.* 750 F.2d 1569, 224 U.S.P.Q. (BNA) 409 (Fed. Cir. 1984). Therefore, it is clearly not *per se* undue to make and test several fragments and/or variants, particularly when specific guidance was clearly disclosed in the specification coupled with what was known in the art at the time the invention was filed.

As disclosed in the specification, HPRT-2 activity can be assessed by the formation of [^{14}C]IMP. *See* page 15, paragraph [0073] and Figure 5 of the specification as filed. Consequently, nothing more than a basic knowledge of the genetic code and what is described in the specification would be required for the skilled artisan to make and use every single one of the polynucleotides which encode polypeptide fragments or polypeptide variants that have HPRT-2 activity.

With respect to polynucleotide fragments, the specification describes and teaches uses of the claimed polynucleotide fragments as, for example, PCR primers and/or probes. The specification provides written description for claims 91-102 (nucleotide sequences encoding fragments of the full-length polypeptide). At the time the invention was made, it was routine in the art to use such fragments that do not require a retention of biological activity, for example, as an immunogen.

The Examiner has cited *In re Wands* for determining the criteria for undue experimentation. The present application presents a situation very similar in *In re Wands* where the specification was found enabling for the claimed antibodies because of the considerable direction and guidance in the specification, the high level of skill in the art, and the well-established methods needed to practice the invention. The present specification, like *In re Wands*, provides more than ample guidance to those of ordinary skill in the art for how to make and use the claimed polynucleotides encoding polypeptides.

Applicants assert one of skill in the art would be able to make and/or use polynucleotide variants and polynucleotide fragments encoding polypeptide fragments based on the teachings of the specification, without undue experimentation. Thus, the disclosure meets the requirements of 35 U.S.C. § 112, first paragraph, as providing

adequate enablement for the claimed invention. A patent Applicant's specification disclosure that contains a teaching of how to make and use the invention must be taken as enabling unless the Patent Office provides sufficient reason to doubt the accuracy of the disclosure. *In re Marzocchi*, 439 F.2d. 220, 223-224, 169 U.S.P.Q. 367, 369-370 (C.C.P.A. 1971).

Therefore, in view of the foregoing, Applicants submit that the claims fully meet the enablement requirements of 35 U.S.C. § 112, first paragraph, and respectfully request that the rejection be reconsidered and withdrawn.

V. Provisional Double Patenting Rejection

The Examiner has rejected claims 1-10, 12-20, 22-31, 33-47, 49-57, 59-68, and 70-74 under the judicially created doctrine of obviousness-type double patenting over the claims 1-9 of co-pending U.S. Application No. 09/189,833. *See* Paper No. 20031112, page 10, section 12.

Applicants respectfully disagree and traverse. Applicants note that the above-referenced application has been patented (U.S. Patent 6,653,446, issued November 25, 2003). A copy of the issued claims is attached as Exhibit B. As the granted claims are directed to polypeptides, which were restricted from the polynucleotide claims of the present application, Applicants respectfully assert that an obviousness-type double patenting rejection is not permitted under 35 U.S.C. § 121. *See* M.P.E.P. § 804.01. Moreover, since claims 1-9 of Application Number 09/189,833 were not pending at the time the instant rejection was made, the basis for the rejection is incorrect. Accordingly, Applicants respectfully request the Examiner to reconsider and withdraw the provisional obviousness-type double patenting rejection.

Conclusion

Applicants respectfully request the amendments and remarks of the present response be entered and made of record in the present application. In view of the foregoing amendment and remarks, Applicants believe they have fully addressed the Examiner's concerns and that this application is now in condition for allowance. An early notice to that effect is urged. The Examiner is invited to call the undersigned at the phone number provided below if any further action by Applicants would expedite the allowance of this application.

Applicants believe that there are no fees due in connection with the filing of this paper. However, should a fee be due, please charge the fees to our Deposit Account No. 08-3425. If a fee is required for an extension of time under 37 C.F.R. § 1.136, such an extension is requested and the appropriate fee should also be charged to our Deposit Account.

Respectfully submitted,

Date: Mar. 22, 2004

Melissa J. Pytel (Reg. No. 41,512)
Attorney for Applicants

Human Genome Sciences, Inc.
14200 Shady Grove Road
Rockville, MD 20850
(301) 610-5764 (phone)

MJH/MJP/JL/vr